

VISIT...

LANZAROTE
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Comment on chest & heart x - ray

1. Type
2. View
3. Dose
4. Centralization
5. Mediastinum
6. Soft Tissue
7. Bone
8. Diaphragm
9. Chest
10. Heart

Diagnosis

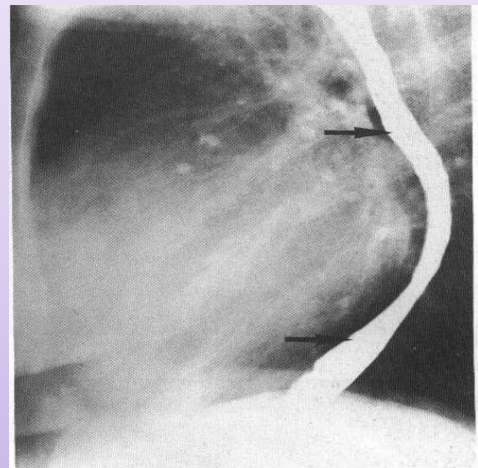
1) Type

Plain



Contrast : Barium swallow

Broncography



2) View

Posteroanterior



Lateral : usually with barium swallow



3) Dose

- **Average:-** the vertebral bodies should just be visible through the heart.
- **Soft:-** the vertebral bodies are not visible, film will look 'whiter'
- **Hard:-** the vertebral bodies clearly identified and easily counted through the heart, the film appears too 'black'

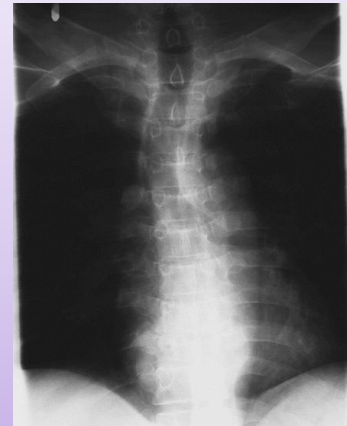
Average



Soft



Hard



NB :Indications of hard x – ray :

Carina – calcification .

4) centralization

Comment on centralization by : equal distance between the medial ends of both clavicle and midline (vertebral spine)



Patient centralization is a must to comment on the mediastinum

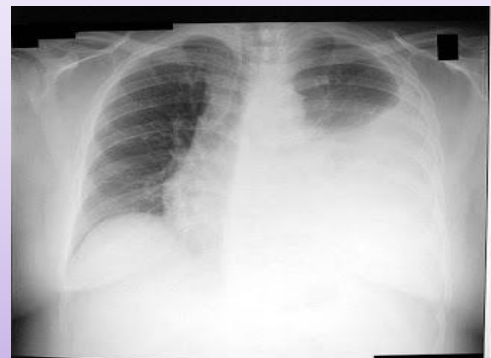
5) mediastinum

By trachea (column of air)

By Heart (2 / 3 to the left)

*** Tracheal lower part is slightly shifted to the right because of aortic arch.**

Mediastinal shift



6) soft tissue

As esophagus or breast tissue

Usually no abnormalities were detected .

If present try to describe it

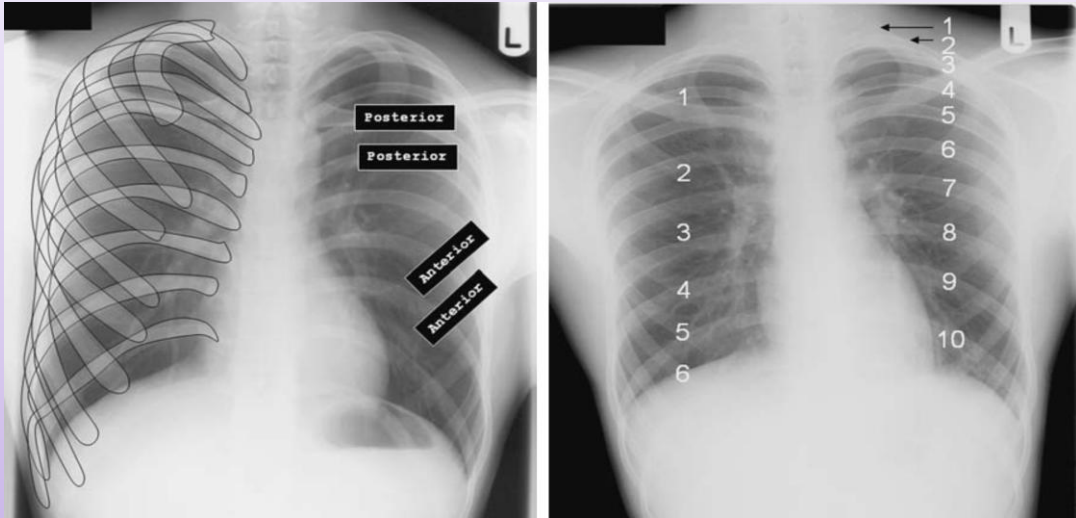
Female breast



7) Bone

Thoracic cage

The ribs pass transversely at the posterior aspect and obliquely at anterior aspect



Sternum (Median sternotomy)



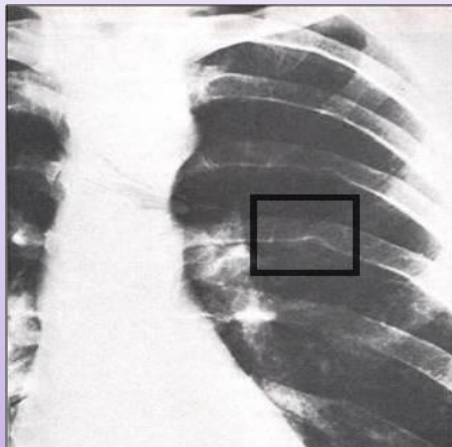
Vertebrae (scoliosis)



Kyphosis



Notched ribs due to vascular collaterals



Cervical rib

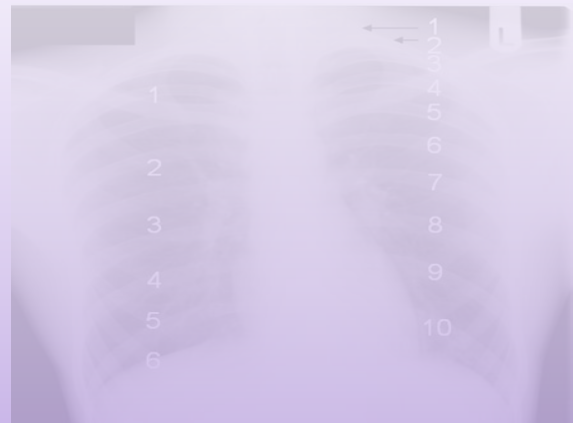


8) Diaphragm

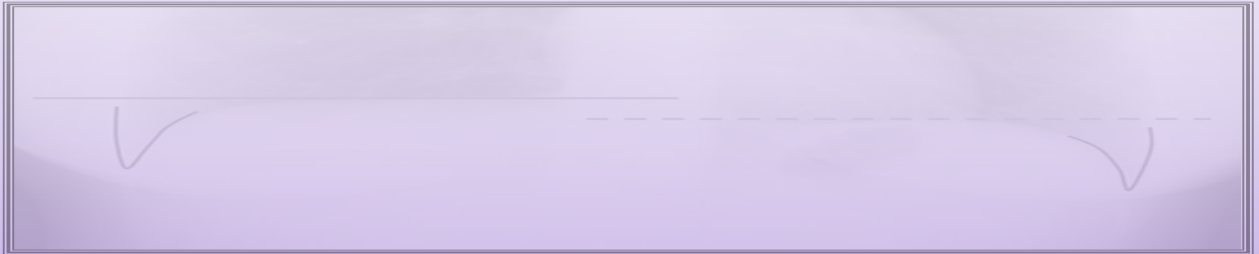
Normal : smooth , convex in normal site

Anterior : cut 6th rib .

Posterior : cut 10th rib
may be used to avoid changes during respiration .

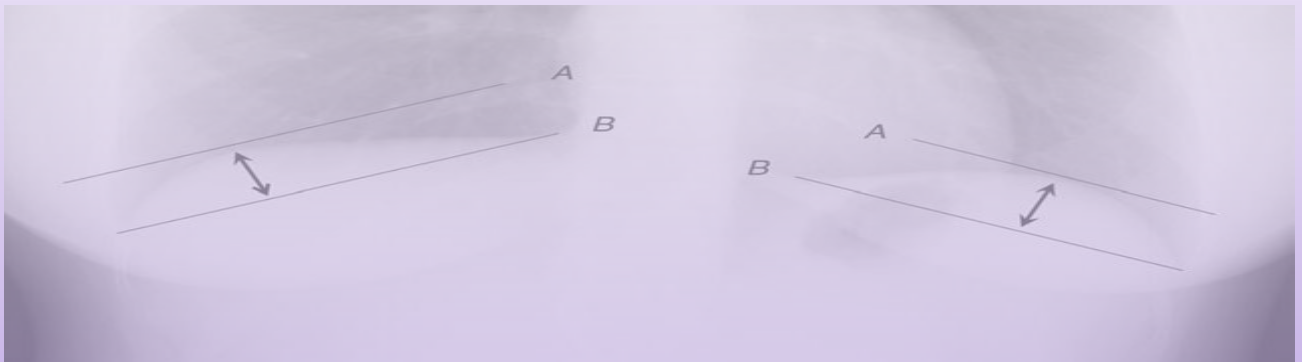


The right diaphragm is usually 1–1.5 cm higher than the left.



The 'curvature':-

the highest point of a hemidiaphragm should be at least 1.5 cm above a line drawn from the cardiophrenic to the costophrenic angle



ABNORMALITIES :

Low diaphragm

- 1 . Emphysema .
- 2 . pneumothorax .

High diaphragm

- 1 . Paralysis .
- 2 . Fibrosis .
- 3 . collapse .

Collapsed lung :**Tented diaphragm.****Mediastinal shift to the same side.****Overcrowded ribs .****Diaphragmatic paralysis****9) Chest****10) Heart****Describe the lesion****Example of comment on chest or heart x - ray :**

Plain x - ray chest and heart , posteroanterior view, average dose , patient is well centralized , with central mediastinum , no abnormalities were detected in soft or hard tissue , diaphragm is smooth , convex and in normal position ,

Steps of chest X – ray

1st step

A) Costophrenic angle

2nd step

B) Opacity

Whole lung	Limited opacity
Mediastinum Either : Shift to othe side , same side Or central	1 . Lobe 2 . triangular . 3 . circular 4 . Multi circular 5 . others

3rd step

C) Hilar

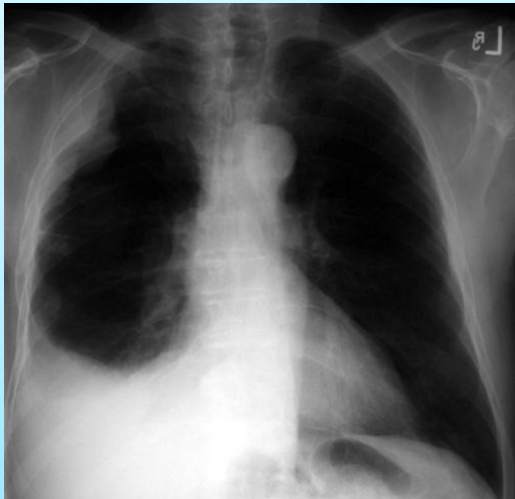
4th step

D) Hypertranslucency

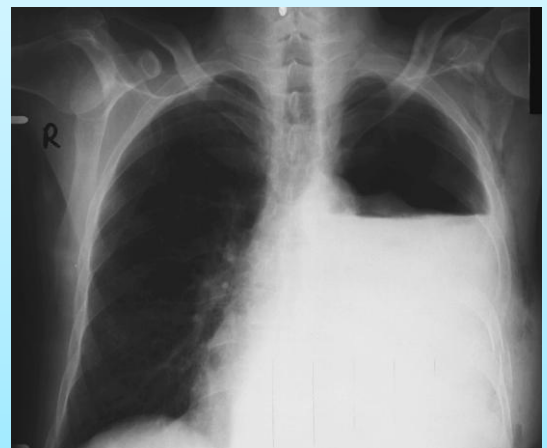
1st step

A) Costophrenic angle**Free****Obliterated by homogenous opacity****Pleural effusion****Raising to axilla .****Mild : 5th & 6th ribs (< 4)****Moderate : 2nd & 4th ribs (2-4)****Severe : above 2nd rib (> 2)****Hydropneumothorax****Horizontal level****with Jet black above****Collapsed lung****Pleural effusion**

The costophrenic angle obliterated by homogenous opacity with upper border raised to axilla

**Hydropneumothorax**

The costophrenic angle obliterated by homogenous opacity has horizontal upper border and Jet black above with collapsed lung close to the hilum



- In moderate or massive Pleural effusion the mediastinum usually shifted to the opposite side.
- But may not due to underlying Lung collapse or fibrosis as in **T.B. or malignancy**.

2nd step**B) Lung opacity****1 – Whole lung opacity****LOOK TO THE MEDIASTINUM**

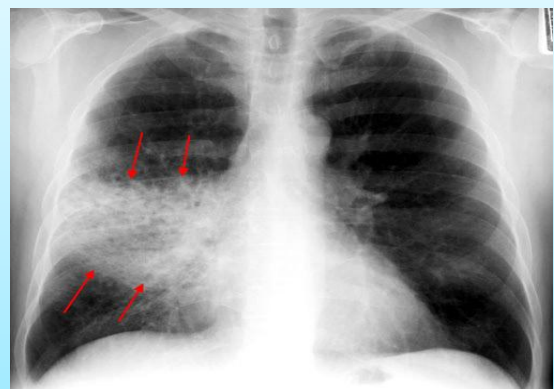
<u>SHIFTED TO THE OPPOSITE SIDE</u>	<u>CENTRAL</u>	<u>SHIFTED TO THE SAME SIDE</u>
<u>MASSIVE PLEURAL EFFUSION</u>	<u>TOTAL LUNG PNEUMONIA (TLP)</u>	<u>LUNG FIBROSIS OR COLLAPSE</u>
		

2. Limited opacity

Comment on
Number
Size
Association .
site wall

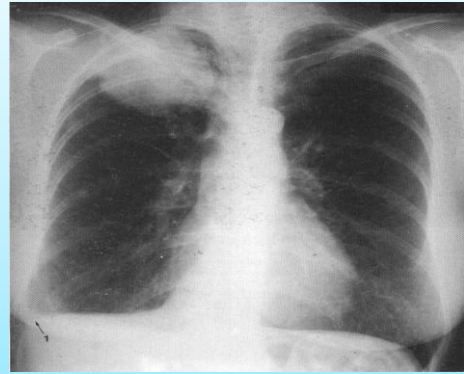
A) Lobe**Lobar pneumonia**

Homogenous opacity at one lobe with central mediastinum

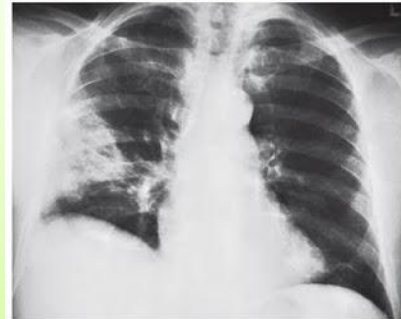
Lobar pneumonia

DD of apical opacity

- Apical pneumonia
- TB
- Pancoast tumour

**B) Triangular****Pulmonary infarction**

Triangular opacity with
base directed outwards .

**C) Rounded opacity****COUNTABLE****USUALLY SOLITARY OR FEW**

Ring : Has a rim

Provided no normal structure sharing

DD of ring opacity:

- Cavity
- Abscess
- Lung cyst



Circle : (totally opaque)

Coin shadow

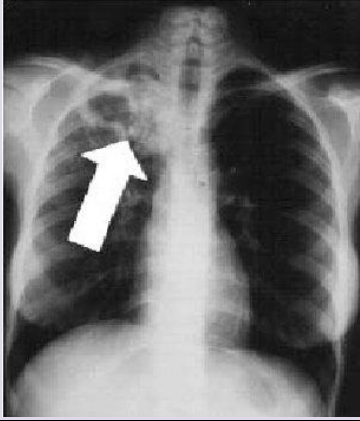
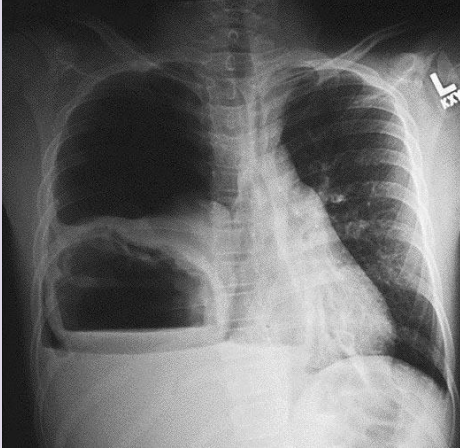
cannon balls (**multiple**)

DD of coin shadow:

- T.B.
- Malignancy
- Infection (Pneumonic stage of Abscess).
- Calcified lung cyst (hydatid).
- Foreign body



RING OPACITY

<u>CAVITY</u>	<u>ABSCESS</u>	<u>LUNG CYST</u>
<u>SURROUNDED BY CONSOLIDATION</u>	<u>SURROUNDED BY CONSOLIDATION WITH FLUID LEVEL</u>	<u>WELL CIRCUMSCRIBED</u>
		
		

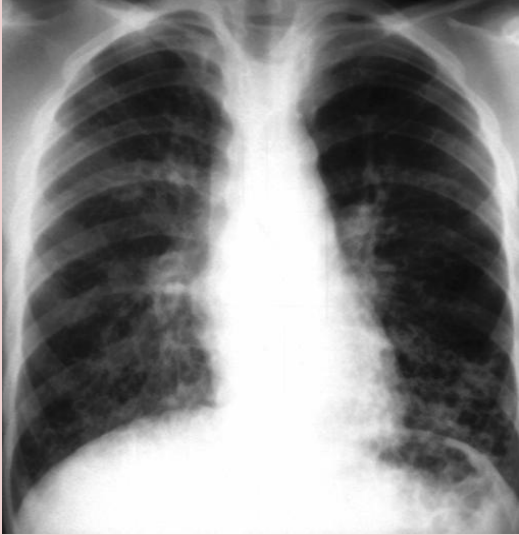
Coin shadow for DD :



Canon ball metastases

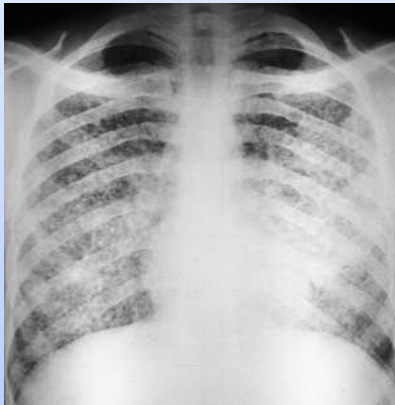


D) Multi circular opacity

HONEYCOMB <u>BRONCHIECTASIS</u>	SOAP BUBBLE <u>POLYCYSTIC LUNG</u>
HONEYCOMB OPACITIES SURROUNDED BY CONSOLODATION WITH APICAL JET BLACK	
	

Other opacities

Miliary shadow :
Multiple pin point
Diffuse & bilateral



Reticular with nodules :
Interstitial lung fibrosis
Bilateral



Unformed opacities :
Described as fluffy cotton
Bilateral
Bronchopneumonia

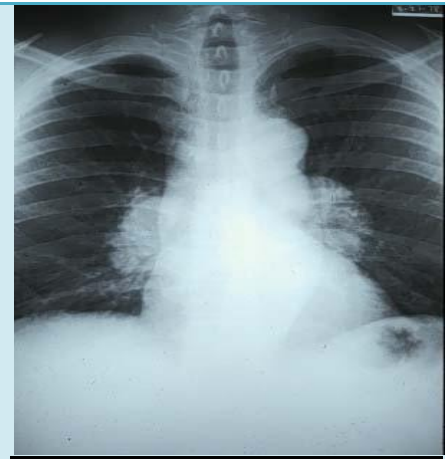
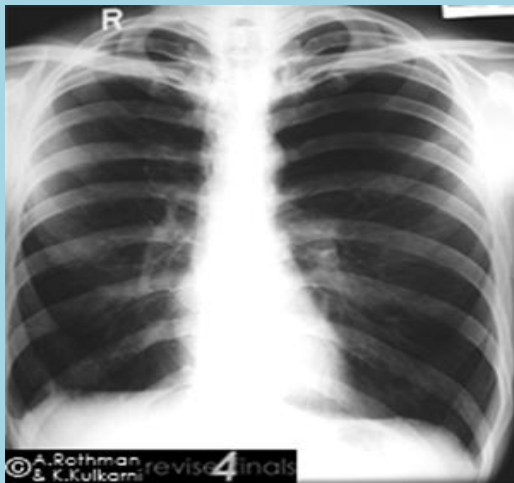
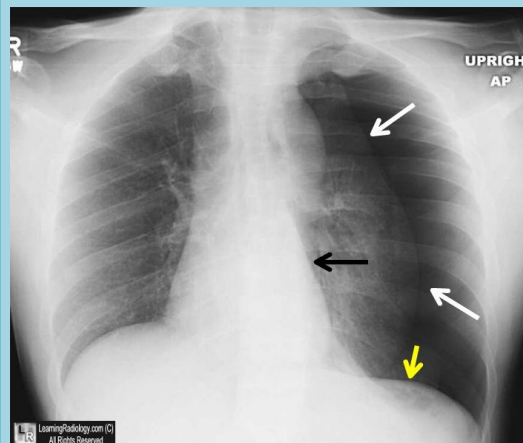


DD of military shadow :

- Miliary TB .
- Metastasis (thyroid , Breast , Prostate)
- Lymphangitis carcinomatosa
- Pneumoconiosis
- Haemosiderosis

DD of Fluffy cotton

- Bronchopneumonia
- TB pneumonia
- Metastasis

3rd step**C) Hilar opacity**UNILATERALBILATERAL**TUBERCULSIS****NEOPLASTIC (PRIMARY OR 2NDRY)****INFECTIONS****SARCOIDOSIS :- NEVER UNILATERAL**4th step**D) Hypertranslucency**EMPHYSEMA**(HYPERINFLATION)****LUNG : HYPERTRANSLUCENT****RIBS : HORIZONTAL , WIDE & PARALLEL****DIAPHRAGM : LOW & FLAT****HEART : RIBBON SHAPED****HYPERINFLATED CHEST AS
COPD (BILATERAL)**PNEUMOTHORAX**1) JET BLACK (ABSENCE OF
BRONCHO VASCULAR MARKINGS) .****2) UNILATERAL****3) COLLAPSED LUNG****4) IN TENSION PNEUMOTHORAX
THERE IS MEDIASTINAL SHIFT TO
THE OPPOSITE SIDE .****PNEUMOTHORAX IS USUALLY
UNILATERAL .****NB : Before diagnosis of hyperinflated lung observation of the lung base may diagnose a honey comb appearance .**

HEART X - RAY

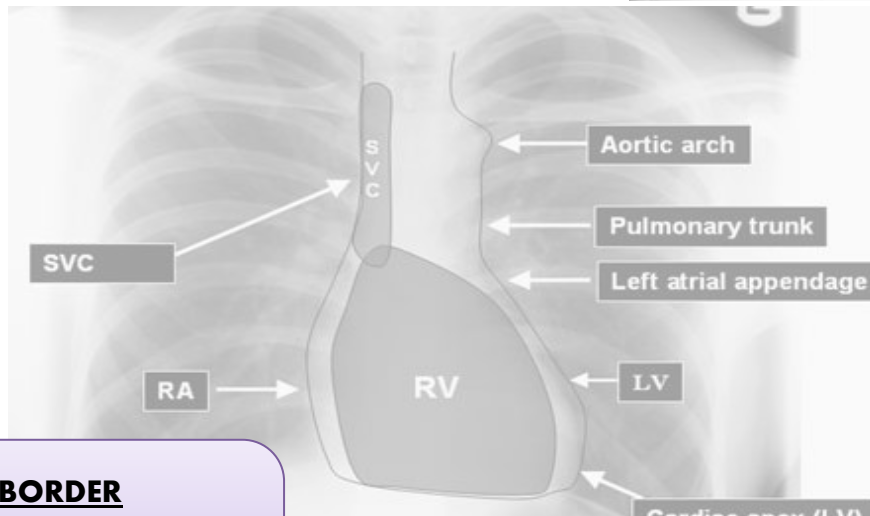
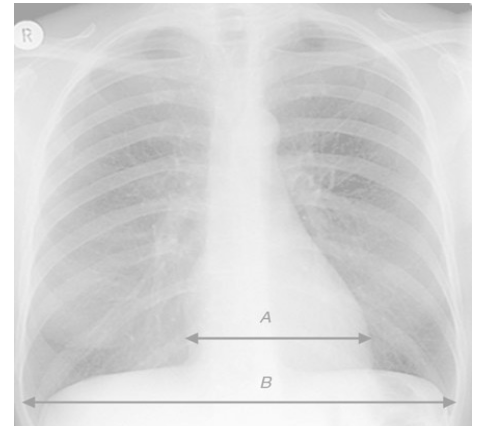
INTRODUCTION : NORMAL FINDING

A) Posteroanterior view

1) WIDTH :

Cardiothoracic ratio = $< 50\%$

2) BORDERS :



B) THE RIGHT BORDER

- = Upper third by superior vena cava
- = Lower two third by the right atrium .

A) THE LEFT BORDER :

- = The aortic arch (knob or knuckle)
- = Main pulmonary artery
- = Left atrial appendage
- = Left ventricle

COMMENT ON HEART X -RAY P.A VIEW :

A) chamber ++ :

- 1 . Cardio / thoracic ratio $> 50\%$.
- 2 . Cardio phrenic angle & apex (for ventricular ++)
- 3 . Boreders of the heart (For atrial ++)

B) Pulmonary vasculature

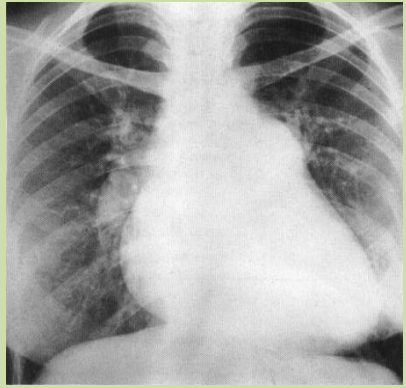
C) Huge heart

D) others

A) CHAMBER ++

Cardio thoracic ratio
> 50 % = cardiomegaly

Ventricular enlargement:

	<u>Left ventricular enlargement</u>	<u>Right ventricular enlargement</u>
Cardio phrenic angle	Obtuse	Acute
Apex	Deeping dawn	Tilting down
		

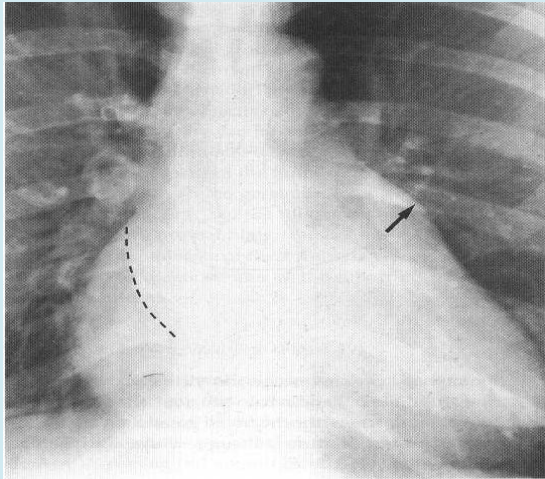
AORTIC CONFIGURATION

- 1 . **Prominent aortic knuckle**
- 2 . **Exaggerated waist**
- 3 . **Left ventricular enlargement .**

CAUSED BY : A.S – systemic hypertension



Atrial enlargement :-

<u>LEFT ATRIAL ENLARGEMENT</u>	<u>RIGHT ATRIAL ENLARGEMENT</u>
(MITRALIZATION) 1. LOSS OF WAIST (STRAIGHTENING) 2. DOUBLE CONTOUR AT RIGHT BORDER . 3. WIDENING OF CARINA .	>1/3 OF HEART PASSES MIDLINE OR HEART REACHES THE INNER 3RD OF RIGHT LUNG .
 BETTER BY BARIUM SWALLOW: INDENTATION + _ DISPLACEMENT . 	

[1] M.S. = Mitralization + P. Congestion

[2] M.R. = Mitralization + L.V. ++

STAGES OF MITRALIZATION

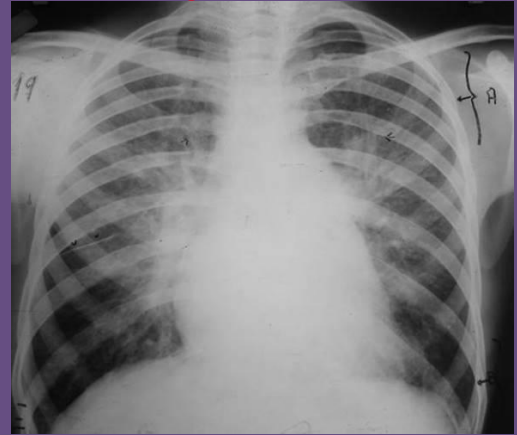
st & nd Stages 1 & 2	rd Stage 3	th Stage 4
P. congestion. Obliterated Waist. Double Contour.	st & nd Stages As, 1 & 2 + P. H. ++	rd Stage As, 3 + R.V. ++

B) PULMONARY VASCULATURE

1) Vein (pulmonary congestion) :

- Prominent upper lobe vessels (Moustache sign)
- Kerley's B line : basal , short , thin & horizontal (P .edema)
- Parenchymetous p . edema :
(Acute pulmonary edema)
Haziness , butterfly (Bat wing sign)

(Moustache sign with mitralization)



2) Pulmonary hypertension :

- Periephral pulmonary oligemia
- Dilated main artery (Pruning P .amputation)



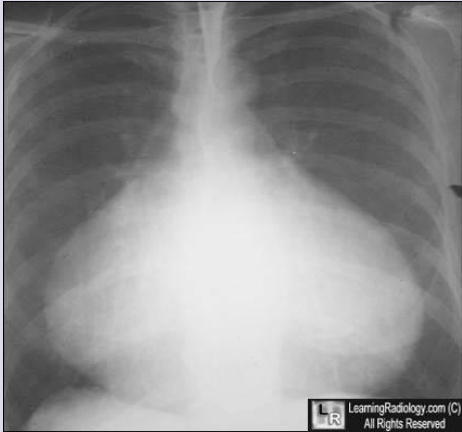
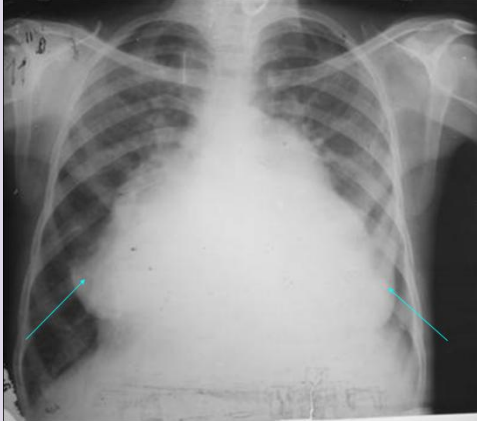
(oligemia)

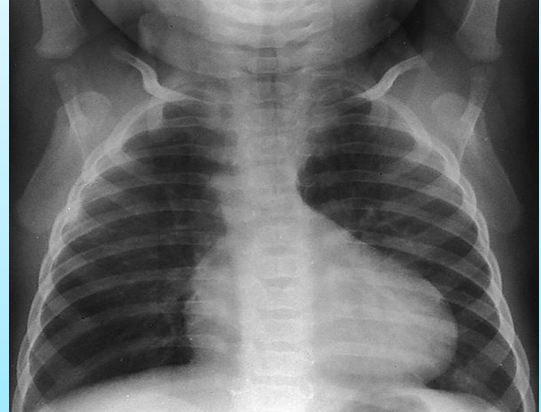
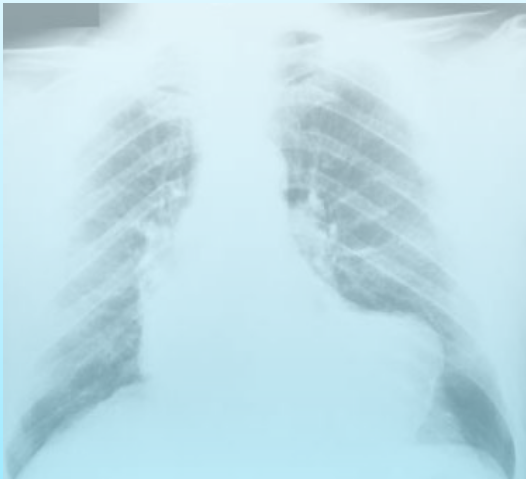
3) Arterial :

- Oligemia : decreased broncovascular marks (BVMs)
- Plethora : dilated main & periephral pulmonary vascular outer third as in VSD / ASD .



C) HUGE HEART

	<u>PERICARDIAL EFFUSION</u>	<u>GROSS CARDIOMEGALY</u>
SHAPE	FLASK	IRREGULAR
BORDER	SMOOTH SYMMETRICAL	IRREGULAR
		 <u>GROSS CARDIOMEGALY :</u> • MULTIPLE VALVE LESIONS • CARDIOMYOPATHY • ADVANCED HF

D) OTHERS**Constrictive pericarditis****Coeur in sabot in Fallot tetralogy****Left ventricular aneurysm****Isolated dextrocardia****Dextrocardia with situs inversus totalis**

B) Lateral view

LATERAL VIEW MAY BE PLAIN OR WITH BA SWALLOW .

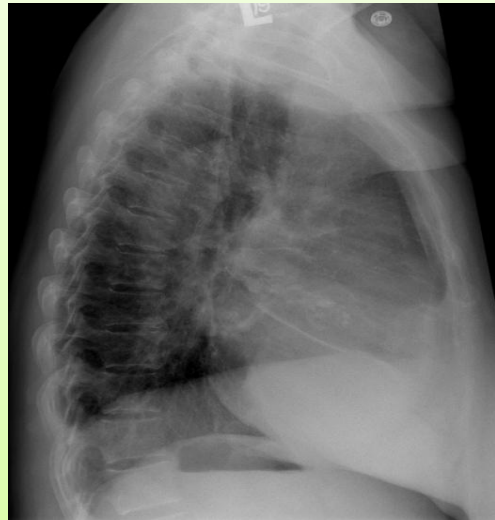
obliteration of retrosternal space

(Right ventricular enlargement)



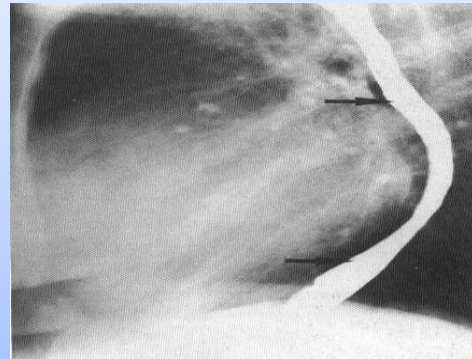
Obliteration of prevertebral space

(Left ventricular enlargement)



Lateral view with barium swallow show posterior displacement and indentation of barium due to left atrial enlargement

Left atrial enlargement



Vertebral column

Comment (A-B-C-D) :

A- Alignment :- Spadylolithias

B- Border:-

Process – Osteophytes

Defect – Fracture.

C- Curvature:- Lordosis (Lost in ank. Sp.)

D- Disc:- Wide in Osteoporosis.

+ Density e.g. osteopenia as in Osteoporosis.

Diseases:-

- Osteoporosis.
- Spondylitis.
- Pott's D.D. ----
- Ankylosing Spondylitis

Osteoporosis

Cod fish spine

A- Alignment :

B- Border:- Biconcave

C- Curvature:

D- Disc:- Wide

+ Density :- Osteopenia



SPONDYLOSIS

A- Alignment:-

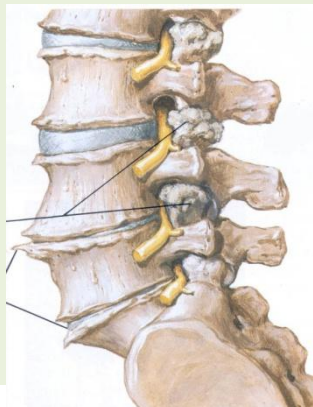
B- Border:- Process

(Osteophytes = lipping)

C- Curvature:- Abnormal

D- Disc:- Narrow

+ Density :- Sclerosed vertebral rim



Pott's fracture (DD)

	<u>POTT'S</u>	<u>TRAUMATIC</u>
NUMBER OF AFFECTED VERTEBRAE	MORE THAN 1 (FUSED TOGETHER)	ONLY 1 (WEDGE SHAPE)
SPACE	LOST	PRESERVED
SOFT TISSUE	SHADOW OF COLD ABSCESS	NO
		

ANKYLOSING SPONDYLITIS**A- Alignment:-****B- Border:- (Bamboo sign)**

- calcification of longitudinal Ligament & annulus fibrosis
- Syndesmophytes

C- Curvature:- loss of Lordosis
(flexion attitude)**D- Disc:-** Narrow space**+ Density :-** + calcification of post. ligament (Dagger sign)

Triad of :
Syndesmophytes
Dagger sign
Sacroiliitis

SKULL

Comment on

1- Size of the Skull

2- Base :- Mandible & Sella Tursica

3- Vault:- Outer tablet
Inner tablet
Diploid space

ACROMEGALY

1- SIZE OF THE SKULL :- LARGE

2- BASE :- WIDE SELLA TURSICA
PROGNATHISM

3- VAULT:- THICKENING
PROMINANT OCCIPITAL & SUPRA ORBITAL PROCESSES
PROMINANT FRONTAL AIR SINUS



CHRONIC HEMOLYTIC ANEMIA

1 SIZE OF THE SKULL :

2 BASE :

3 – VAULT :

LOST OUTER TABLE
PROMINENT INNER TABLE
HAIR ON END APPEARANCE



HANDS & FEET

RHEUMATOID ARTHRITIS

(TRIAD)

A) DISTRIBUTION = AFFECT -MCP & PIP JOINTS.

B) DEFORMITIES = ULNER DEVIATION
Z SHAPE THUMB.

COMPLICATION = SUB-LAXATION OF MCP ±
OSTEOPROSIS

+ SOFT TISSUE = FUSIFORM FINGER.



OSTEOARTHRITIS

N.G.O.A. :- NODAL GENERALIZED OSTEO ARTHROSIS.

A- DISTRIBUTION = AFFECT D.I.P. BUT M.C.P FREE.

B- DEFORMITIES = OSTEOPHYTES + SCLEROSING

C- COMPLICATION = HEUBERDEN & BUSCHARD
NODULES



CHRONIC HEMOLYTIC ANEMIA

BONE = BOXY (LOSS OF WAIST)
WIDE MEDULLA & THIN CORTEX
MOSAIC (LATEX APPEARANCE)

N.B. = SMALL SIZED HAND (CHILD HAND X RAY)



ACROMEGALY

- BIG SIZE HAND <DIAGNOSTIC>
- SPADE LIKE.
- MUSHROOM OF DISTAL PHALANX



GOUT

- DISTRIBUTION: MTP OF THE BIG TOE
- DESCRIPTION: PUNCHED OUT
- $\pm$ SOFT TISSUE SHADOW

